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# CURRENT LITERATURE.

## BOOK REVIEWS.

### Flower ecology.

As PREVIOUSLY stated in the pages of this journal (**26**: 358), the first volume of Knuth's *Handbuch der Blütenbiologie*"[1] gives a general introduction to the subject of the pollination of flowers, with the bibliography.

The second volume gives an account of the investigations which have been made upon the European and Arctic floras. The work being professedly based upon Hermann Müller's "Befruchtung der Blumen durch Insekten," even more closely resembles the English translation by Thompson, "The Fertilization of Flowers." The resemblance here extends to the introduction of the general results of other authors and in the arrangement of the families, part 1 including the Ranunculaceæ to Compositae, and part 2, Lobeliaceae to Gnetaceæ. As an example of the treatment of the particular cases we may take that of *Malva silvestris*. There is a citation of authors, an account of the mode of pollination, accompanied by a reproduction of Müller's figures, and a combined list of visitors observed by Müller and the author. Then follows the visitors observed by Alfken, Schletterer, Schenck, Loew, Scott-Elliot, and Smith. The lists are often quite fragmentary, observed in different places, and under varying conditions, so that they will hardly form a homogeneous combination, but it is a good thing to have them collected together. The fact that the most scattered and inaccessible writings are usually the most worthless does not keep anyone from rejoicing that he does not have to waste his time hunting for them. Knuth draws upon the writings of pure entomologists. Their writings are very important for the insects they especially collect, but, as a rule, they do not notice all of the visitors. Their lists are far better than those made out by persons who make you wonder if they can tell a hive-bee or bumblebee from an Eristalis.

The first part contains 697 pages, 210 figures, and as a frontispiece a portrait of Herman Müller. For a frontispiece the second part contains a portrait of Darwin, surrounded by Severin Axell, Federico Delpino, F. Hildebrand, and Fritz Müller. This part contains another 210 figures. The volume closes with a list of the flower-visiting insects, each species being followed by a list of the plants on whose flowers it has been taken.

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[1] KNUTH, PAUL: Handbuch der Blütenbiologie unter Zugrundelegung von Hermann Müller's Werk "Die Befruchtung der Blumen durch Insekten." Band II: Die bisher in Europa und im arktischen Gebiet gemachten blüthenbiologischen Beobachtungen. Teil 2: Lobeliaceæ bis Gnetaceæ. 8vo. pp. iv + 705. *pl. 1. figs. 210.* Leipzig: Wilhelm Engelmann, 1899. *M* 18. geb. *M* 21.

Facts appear here which are quite interesting in connection with statements made on page 114 of the first volume, as well as in connection with some recent writings of mine on oligotropic bees (BOT. GAZ. **28**: 32). *Andrena florea*, mentioned on the page cited as an exclusive visitor of *Bryonia dioica*, appears in **2** : 606 as a visitor of *Bryonia alba*, also, as well as *Sisymbrium officinale*, *Stellaria media*, *Rubus fruticosus*, *Cirsium arvense*, and *Carduus nutans*. *Andrena cettii* (=*A. marginata* F.), mentioned in **1** : 114 as an exclusive visitor of *Scabiosa* (Knautia) *arvensis*, in **2** : 607 is shown to visit *S. columbaria* and *S. suaveolens*, also, as well as *Succisa pratensis*, *Onopordon acanthium*, *Leontodon autumnalis*, *Hieracium pilosella*, *Jasione montana*. *Andrena nasuta* visits *Melilotus alba* also, and *Bombus gerstaeckeri* visits three species of *Aconitum* and *Gentiana asclepiadea*. So all of the exclusive cases are shown to be merely erroneous inferences from improbable data. These lists were evidently made later, and so are not connected with the first statements.

In this work the classification, although systematic within each volume, is geographical. The second volume contains observations made in Europe, excluding all others. If a native European plant has been introduced, for example, to America, any observations made upon the plant in America should be included with the observations made in Europe. This permits a convenient comparison of its normal relations at home with its acquired relations abroad. The latter are clearly subordinate and cannot take the place of the other.

If we enter upon close criticism of the present status of flower ecology, it must be said that it is a heterogeneous mixture of data derived from native plants occupying more or less normal positions in the original flora and exposed to a more or less normal insect fauna, as well as data derived from introduced and cultivated plants which seem erroneously to be expected to reveal their ecological relations without regard to their surroundings. It seems to me that introduced plants should be treated together in a supplementary part, while garden flowers should be again separated as surrounded by conditions clearly abnormal. The objection is to the mixture, not to any kind of data.

By the mystagogues, who amuse themselves by changing names, the nomenclature is quite likely to be regarded as not sufficiently unintelligible to the unskillful. But those who have to consult the literature have to use the nomenclature which is connected with it, whether they like it or not.

This work is by far the most important source of information on the facts and literature of flower ecology, and it should be in the hands of all those who are interested in the subject. I have done enough work with bibliography to observe that too large a part of it does not show anything except that the writers were ignorant of the literature. Even their interest is shown to be fraudulent. They expect us to take an interest in their writings, when they do not care enough for the subject to read what has been written by others.

CHARLES ROBERTSON.

### Propagation of mosses.

DR. CARL CORRENS has been at work for five years upon the vegetative reproduction of the true mosses. In that time he has published several preliminary papers on his researches,[2] and an important collateral paper "Ueber Scheitelwachsthum, Blattstellung, und Astanlagen des Laubmoosstämmchen" in the *Festschrift für Schwendener* (1899). These investigations are now brought together *in extenso* to form a bulky volume of almost 500 pages.[3]

The gametophyte of mosses propagates itself by many methods and by brood-bodies which arise from protonema, or rhizoid, or stem, or leaf. The sporophyte produces normally no propagative organs except the spores. The homology of the brood-bodies of Georgia (with which the researches of Correns began in 1894), Œdipodium, Drepanophyllum, and a few others (all of possible paraphysine nature) remain undetermined. The term brood-organs is restricted to those structures of which propagation is the chief or the coördinate function. The term cuttings is applied to those parts artificially separated by which propagation is possible. The brood-organs of one hundred and twenty-five species are monographically described. Forty species which can be reproduced from cuttings are also elaborately treated.

The terms applied to the brood-bodies have such resemblance in form and sound in German that they must prove objectionable, particularly in speaking. *Bruchstämmchen* or *Bruchäste* are stems or branches which are brittle throughout and may break off anywhere, or even break up into pieces, each capable of growth. *Brutäste* are brittle at base only where a separation layer is formed. *Bruchknospen* are branches brittle only beneath the apex, while *Brutknospen* are short *Brutäste*. In such a case perhaps it is unimportant whether one perceives the distinction between *Bruch* and *Brut!* In the same way we have *Bruchblätter* and *Brutblätter*. *Bulbillen* are defined as *Brutknospen* with reduced leaves, but the organs described as bulbils in *Leptobryum pyriforme* bear not the slightest trace of leaf rudiments; indeed they are elsewhere called "root tubercles."

In the general part (pp. 325–460) Dr. Correns discusses the morphology and phylogeny of the brood-bodies arising on stem, leaves, and protonema.

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[2] Berichte d. deutsch. bot. Gesells. **13**: 420. 1895; **14**: 94. 1896; **15**: 373. 1897; **16**: 22. 1898.

[3] CORRENS, CARL: Untersuchungen über die Vermehrung der Laubmoose durch Brutorgane und Stecklinge. 8vo. pp. xxiv+472. *figs. 185*. Jena: Gustav Fischer. 1899. *M* 15.